



STOP PRESS

DRAGON

DRAGON RELEASES DISKS

Dragon Data Ltd has launched a Disk Drive unit for the Dragon 32 home computer. The Disk Drive will expand the power of your 32, speed up program loading and data file handling. It is the next step up in data and program storage from the cassette recorder and can itself be expanded as you and your Dragon system progress. Priced at £275, the Dragon Disk Drive is a single half height drive in a coated steel case. It has an internal power supply and is easily expandable to a double disk system by inserting an additional drive. Two double units can be linked to form a 4-drive system.

Its specifications are:

Disk Type

5 1/4" Mini diskette

Memory Capacity

(Formatted) 184320 bytes

Disk Organisation

Single sided

Double density

40 tracks (TP)

18 sectors per track

256 bytes per sector

Directory on track 20

Case

Coated steel, capable of holding two half height drives

Weight (with one drive)

4.4Kg

The controller can support up to four drives, single or double sided capability. Up to ten files may be open simultaneously. The disk operating system is held in ROM (Read memory only) on the controller card.

The Dragon Disk Drives will be available through the usual Dragon dealerships and retailers, including Boots and Grooms.

EDITORIAL

Stop Press Number 4 is here! Despite the attraction of the sun-kissed beaches of South Wales at the time of compilation, our latest edition comes packed with programs and articles ready for the onset of darker nights and longer Dragon sessions.

Many young readers will be starting computer studies in their new school year. With a Dragon at home they will have a great opportunity to continue their classroom experiences at leisure. Why not teach them and Dad to program? After all there's nothing like teaching for helping you to learn!

Stop Press, after four issues, has certainly developed a character of its own, quite different from other computing periodicals. We have been encouraged by your letters to believe that its main theme of providing programming material in a helpful way is the right one and long may this continue. Inside this issue there is the usual Machine Code Corner which carries on from the last issue to look at some of the techniques involved with moving graphics. The Young Users Page concentrates on LOOPS and CIRCLES.

Our first competition (Draw a Dragon Logo) produced a good crop of responses from our younger programmers including entries from abroad. Congratulations to you all for some professional programs. This issue's competition is extended to all ages, or even to family entries. So get your heads together and send us your programs, on cassette please, to the editorial address:-

Miss Cathy Hyde
Dragon Data Ltd.
Kenfig Industrial Estate
Margam
Port Talbot
SA13 3PE

The editors have had the privilege of using Dragon Data's new disc system prior to its general release and have been thrilled with its impact on the use of Dragon whether it be in writing programs (the disc-system has an automatic line-numbering feature which is a boon!) or word-processing Stop Press or whatever. We are sure that the introduction of this system will offer many exciting possibilities to Dragon owners for use in their work and we hope to explore this aspect in future editions. Nevertheless we must remember that the reliable and fast cassette interface on Dragon has always been one of its many strong points and we are constantly impressed by Dragon's ability to create and maintain program or data files on tape. (See the letters page for an example of a data file.) Dragon owners with young children (eight years upwards!) may wish to find a suitable book to introduce them to the art of Dragon Programming. Foulsham have now published 'Dragon Magic' (mentioned in a previous Stop Press). Its large size print and amusing cartoons make it an ideal book for the young beginner. Once again the editors invite you to write to us with your hints and suggestions for future articles and programs of interest to other readers.

MACHINE CODE CORNER



In the last edition of *Stop Press*, we explored a few simple methods of moving shapes around the high-resolution graphics screen. Our main concern was vertical movement, since that could be achieved by copying values from byte to byte, without getting involved at the "bit" level. The time has come to grasp the nettle - and look at horizontal movement.

But first we need to learn about a very special register - the Condition Code Register (CC). This is a 1-byte (8 bit) register, in which each separate bit has a job to do in describing the operation state of the computer. Each bit is either 0 (clear) or 1 (set). The eight bits of the CC register are as follows:

E	F	H	I	N	Z	V	C
---	---	---	---	---	---	---	---

E-Error State Flag

F-Fast Interrupt Request Mask

H-Half Carry Flag

I-Interrupt Request Mask

N-Sign Flag

Z-Zero Flag

V-Overflow Flag

C-Carry Flag

When various machine code commands are executed, these flags are frequently cleared or set according to the result of the command. In fact, we have often used the zero flag (Z), without referring to it by name. One effect of the **CMP** command is to set Z if (and only if) the result is "true". For example, **CMP #000F** will set Z if Y is equal to **\$00F**. The **BNE** command makes use of this, by causing a branch if Z is clear. So if Z is set by the **CMP** command, there will be no branch.

Two commands which give the programmer direct access to CC are **ANDCC** (opcode 7C) and **ORCC** (opcode 7A). These perform respectively a logical "AND" and a logical "inclusive OR" between CC and the number in the operand.

For example, to set Z, we need to perform an inclusive OR with binary **00000100**, i.e. with **#4**. This is because an inclusive OR with a 0 results in "no change" (so all except Z) and an inclusive OR with 1 for Z results in 1 whether or not Z was previously set. As a result, **ORCC #4** sets Z. Similarly, to clear Z, we need an AND with binary **11111011**, i.e. with **#251**. This is because an AND with 1 results in "no change" whereas an AND with 0 results in 0. So **ANDCC #251** clears Z.

Now, let's get back to horizontal movement. You will recall that in **PMODE4** each pixel of the high-resolution screen is represented by one bit, which is either "on" (green or buff) or "off" (black). Eight of these bits are combined in one byte of memory. The diagram below shows how a black

segment of 3 pixels wide is moved to the right a pixel at a time.

byte 1	byte 2
7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
1 1 1 0 0 0 1 1	1 1 1 1 1 1 1 1
1 1 1 1 0 0 0 1	1 1 1 1 1 1 1 1
1 1 1 1 1 0 0 0	1 1 1 1 1 1 1 1
1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1
1 1 1 1 1 1 1 0	0 0 1 1 1 1 1 1
1 1 1 1 1 1 1 1	0 0 0 1 1 1 1 1
1 1 1 1 1 1 1 1	1 0 0 0 1 1 1 1

Two bytes are illustrated, and the bits are labelled from 7 down to 0, which is the usual convention. We can break down the various operations as follows:

- a fresh '1' comes in from the left of byte 1;
- the bits of byte 1 are shifted to the right;
- bit 0 of byte 1 moves to bit 7 of byte 2;
- the bits of byte 2 are shifted to the right.

If the diagram is read in reverse order (bottom to top) the problem of horizontal movement to the left is seen to be very similar.

Two commands which go a long way towards solving the problem are **ROR** (Rotate Right) and **ROL** (Rotate Left). These commands rotate the bits THROUGH THE CARRY FLAG. In other words, **ROR** has the effect of (a) transferring whatever is in the carry flag to bit 7, (b) rotating bits 7-0-3-2-1 to 0-3-2-1-0, (c) loading bit 0 into the carry flag. **ROL** has the reverse effect.

A diagram may help.



So the operation of movement to the right may be achieved by setting the carry flag, **ROR** the first byte, **ROR** the second byte. The carry-over between bytes is taken care of automatically by the carry flag.

We shall now use **ROR** to fire an arrow across the screen. First in Basic:

```
10 PMODE4:POLY-COLOR:1:SCREEN:0
20 DIMA(2)
30 DRAW "00100000000000000000"
40 GETB0:IN:LA
50 X:=INX:Y:=Y+1:THROW
60 FOR I=1 TO 20:FOR J=0 TO 1:LA:PRINT
70 NEXT J
```

Note that the DIM statement is necessary for GET/PUT, even though it is not usual to dimension a variable less than 11. The arrow is released by pressing any key. Obviously, machine code is called for (which refreshes the parts other languages can't reach). First we must calculate the address of the bytes making up the arrow. Normally, the graphics screen will start at hex 800, but we shall make the program a little more general (to allow for those who may wish to use PMODE4,2 or those who have a Dragon Disk System in operation). The address of the top left hand corner of the current graphics screen is contained in memory BA55. To this value we must add 5800 = 1680 since the arrow starts on row 58, and each row is 32 bytes. The following program does the job.

			Machine code
1	LDY	#BA	18 82 BA
2	LDY	#800,Y	21 A8 00 00
3	LDA	#0	48 00 00
4	STA	(Y+Y)	87
			20FF
5	LOOP1	LDA	#0
6	LOOP2	LDX	#
7		LDB	#45
8	LOOP3	DEC	#1
9	ROB	#	66 00
10	ROB	1,X	66 01
11	ROB	2,X	66 02
12	LDX	3,X	28 00 00
13	DEC		6A
14	BNE	LOOP3	26 02
15	DEC		6A
16	BNE	LOOP2	26 00
17	LDY	1,Y	21 01
18	DEC	(Y+Y)	7A 7F FF
19	BNE	LOOP1	26 02
20	RTS		7B

Lines 1 and 2 give Y the address of the top-left byte of the arrow. Lines 3 and 4 store 32 in (Y+Y) (to keep a check on the number of times Y is incremented in line 17). A and B are used for counting - they are decremented until they reach zero. Line 5 sets the carry flag, so that the first ROB uses a 1. Note that after a DEC command the zero flag (Z) is set if the result is 0. This is then checked by the BNE command.

The code may be POKEd in using

```
10 DATA 18,82,BA,21,A8,00,00,48,00,00,87,00,00,20,FF,00,00
20 DATA 6A,00,00,21,A8,00,00,66,00,00,66,00,00,26,02,6A,00
30 DATA 6A,00,00,6A,28,00,00,21,01,7A,7F,FF,26,02,7B,00
40 FOR I=1 TO 4:READ C:POKE I+2000,"VAL" C:GOTO 50 NEXT I
```

The required Basic program is then

```
10 PMODE4,1:POLY:COLOR1:SCREEN1,1
20 DRAW "BARBAROSSA'S GIGANTHROB"
30 GO=INSTR$(POLY)="" THEN 10
40 END
50 GOTO 10
```

A much more realistic arrow!



ISLANDS

Can you steer your craft through the islands to the red jolly on the right of the screen? Unfortunately it is rather foggy so you have only occasional glimpses of the islands. The higher your score the rarer the glimpses! If your craft touches the bottom of the shallow water round an island it sticks there a moment before you can release it, if you really run aground you must start back at the beginning. Aim for the fastest time. You steer your craft with the arrow keys and stop it dead with the spacebar.

```
100 FOR I=0 TO 1,4:J=J+STR$(I+1) ABS(J)-2 THEN 100
```

Now insert NEXT into line 550 making it:-

```
100 NEXT X:GOTO 1-510'S RETURN
```

Bon voyage.

```
1 REM ISLANDS, MAVIS PEARSON, KEYBOARD VERSION.
10 POLY$="1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-227
```



YOUNG USER PAGES

GETTING INTO LOOPS AND CIRCLES

Do you enjoy making designs with a pair of compasses? I do. But I find the point always slips and somehow the ends don't tie up as well as they should. Well your Dragon enjoys drawing circles too. There is a special command for circles which may seem a bit daunting at first because it allows you to specify so many things about the circle. However the command works as long as you specify three things (it gives the others default settings). Obviously Dragon needs to know where you want the centre of your circle to be and what the radius is. So `CIRCLE(100,60,50)` is the command which tells the machine to draw a circle centred at screen position 100,60 and with radius 50. To see this you need a little program:-

```
10 PCLAMP:MODE=SCREEN:1:POL
20 CIRCLE(100,60)
30 GOTO 30
```

RUN

Line 10 sets up the graphics screen. Line 20 draws the circle and line 30 keeps the program showing the graphics screen. Use the `BREAK` key to stop the program.

A circle is a beautiful shape but lots of circles make exciting patterns. Let's see how to make them. First we'll put the circle command in a subroutine:-

```
100 CIRCLE:YLR,C:HW,START,FINISH:RETURN
```

This will save a lot of typing and we have all the parameters to play with. This means that we must give them values. We'll use the default values the machine would give for `C:HW,START` and `FINISH`.

```
20 X=125:Y=100:R=50:C=4:HW=1:START=8:FINISH=1
```

We'll use loops to change the values starting with the `X` value. Add these lines to your program:-

```
40 FOR X=0 TO 240 STEP 5
70 GOSUB 100
80 NEXT
```

Line 40 moves the centre of the circle across the screen. Line 70 calls the subroutine which draws the circle and line 80 makes the program go back through the loop until `X` has a value above 240.

Your whole program should now look like this:-

```
10 PCLAMP:MODE=SCREEN:1:POL
20 X=125:Y=100:R=50:C=4:HW=1:START=8:FINISH=1
40 FOR X=0 TO 240 STEP 5
70 GOSUB 100
80 NEXT
90 GOTO 90
100 CIRCLE:YLR,C:HW,START,FINISH:RETURN
```

RUN this.

To make the circle drop all we need to do is to type a different line 40:-

```
40 FOR Y=0 TO 120 STEP 20
```

Now change the 20 to 2 and see what happens. Of course you can add more loops and change both `X` and `Y` together.

What about changing the radius? Type in this new line 40:-

```
40 FOR R=0 TO 120 STEP 20
```

RUN the program and then change line 40 again:-

```
40 FOR C=0 TO 120 STEP 2
```

Notice that when the circle touches the boundary of the screen it is flattened. One way to draw a boundary round a screen is to draw a circle with a large radius.

The pretty pattern above has an added pattern caused by interference patterns on the screen. We can add colour to make it more interesting. There are four colours to choose from though, of course, one is the background colour. Add line 50 to your program. It changes the value of `C` from 1 up to 4 and then sets it back to 1 again. So each time the machine goes through the loop the colour changes.

```
50 IF C=4 THEN C=C-1 ELSE C=1
```

RUN your program now. Of course you can't see the circle drawn in the background colour!

The next parameter is `HW` or `HEIGHT TO WIDTH RATIO`. It pulls the circle out into an ellipse like an egg or rugby ball. If `HW` is less than 1 the circle is flattened; if `HW` is from 1 to 255 the circle is pulled up and down. Let's try it with a new line 40.

doi:10.1017/S0022292412001609

When you RUN this you will see a pulsating blob. It throbs because every fourth ellipse is drawn in the background colour and over-writes some of the previous ellipses. A small alteration in line 58 removes this. Just change the 1 at the end to 2. Now the background colour is not used.

The **START** and **FINISH** parameters allow us to draw incomplete circles and ellipses; the **START** and **FINISH** values go from 0 (3 o'clock) to 1 (clockwise all the way to 3 o'clock again). In fact we can go round nearly four times using values up to nearly 4. We need yet more new line 48s and we must clear the screen each time.

THESE RESULTS WERE OBTAINED BY A SINGLE RESEARCHER.

Run the program now and then again with this code block:

DOI: 10.1002/for

Now if we draw just a little bit of the circle (an arc) each time and increase the radius we should see a spiral. We need line 42 which increases START from 2 to 1 and back to 2 again and again and keeps FINISH a little bit ahead of START. Of course we need to change line 43!

```

DO FOR R=1 TO 10
DO START=R/10;ST=ST+INT((FINISH-START)*7

```

Rather pretty isn't it? Notice that `START` and `ST` are the same as far as Dragon is concerned. It uses only the first two letters to identify the variable.

Now back to those compass drawings. They look best in PMODE4 so change line 18, and change the colour in line 28 to C=1. For those of you who know some trigonometry, we need a value for π and can use arctan to obtain one, $\text{Tan}(\pi/4) = 1$ so $\pi = 4 * \text{arctan}(1)$. Add or overwrite these lines in your program:

```

20 PI=3.14159265358
40 FOR T=0 TO 200 STEP 10
60 TH=3.14159265358
80 Y=100+COS(PI*TH)*Y=100+8*PI*TH

```

I hope you like doughnuts! If you prefer donuts
after the value of $R1$ is now 30 to $R1 = 0$.



DUCKS

Here is another contribution from Gareth Rowlands. You start off with 32 ducks, 96 bullets and 7500 time units. The space bar is your "trigger" if you get them all, you are given another 32 ducks, but not so many bullets and not so much time (your score continues to mount). The number of bullets is controlled by B0 and B5 in line 315. The time limit is controlled by T in the same line.

```

1 REM DUDES
2 REM GARETH ROWLANDS, 1993
30 CLS:CLLEAR@F:PRG3:=3-33-8702-1
40 SOUND$=SOUND(121):SOUND$=1
50 SOUND$=33
60 SOUND$=33
70 C=3:TIMER=PRINT@11,"TIME(L,C,PRG3):GOSUB 330
80 IF INKEY#="" AND C=0 THEN
90   BU=BU+1:IF C<1 THEN
100    SOUND$=1:PRINT@11,"BULLETS"BU;
110    FOR I=121 TO 150 STEP -50:C=(PRG3)
120    GOSUB330:FOR I=64 TO FOR I=150 NEXT
130    X=(PRG3):GOSUB 330:FOR I=64 TO
140    IF FOR I=0 TO 150 THEN FOR I=150 IF BU=0
150    THEN
160 ELSE
170    FOR I=150 SCREEN$=1:SOUND$=1
180    I=I-700:IF X<=1 THEN Z=1 ELSE Z=30-X+1
190    IF Z=0 THEN U="" ELSE U=LEFT$(Z,2)
200    IF Z=32 THEN R="" ELSE R=RIGHT$(Z,2)
210    D1=D1+1:D1=U+" "+R:SC=SC+1
220    PRINT@11,"SCORE"SC;
230    IF D1=32 THEN
240      IF BU=0 THEN
250        PRINT@11,"SCORE"SC;
260        PRINT@11,"TIME(L,C,PRINT@11,"BULLETS"BU;
270        PRINT@11,"WANT ANOTHER GO?";
280        SOUND$(2):SOUND$(3):SOUND$(4)
290        A$=INKEY$:IF A$ THEN
300          IF A$="Y" THEN CLS:END ELSE RUN
310          PL$="CONSOLE:CONSOLE"
320          SS=SS+10:IF SS<34 THEN SS=34
330          T=1:GOTO 1<200 THEN
340            T=2000
350            SC=SC+BU:BU=0
360            GOTO 30
370            D1=STR$(D1):D1=D1+R$+32:CLS
380            TIME$=""
390            SC=SS+30:PR=150:BU=150+700
400            RETURN
410            IF X=0 THEN PRINT@PR,D1:RETURN
420            PRINT@PR,RIGHT$(D1,LEFT$(
430              D1,2):D1,RETURN
440            FOR I=150,140:FOR I=140,130:FOR I=
450              130,120:FOR I=120,110
460                G=PRG3
470            FOR I=150,140:FOR I=140,130:FOR I=
480              130,120:FOR I=120,110
490                RETURN

```

LETTERS FROM READERS

Readers of STOP PRESS of all ages have sent in letters containing programs, tips and queries. All will be answered in the fullness of time, and we express our thanks to all writers, whether or not their contribution is included.

Two letters received concerned printers. One from D.W. Abel suggesting that a helpful article on printers would not come amiss, confirmed our feelings and has already led to the preparation of an article for the next issue. The other letter came from R.R. Computer Services, 2x Pinfild Avenue, Northwood, Hail 3L offering listings of Dragon Programs (cost £3) on receipt of the program on cassette.

R.J. Leslie provided us with a program called INHBLIGHT which produces "inblights" similar to those used in the famous Rorschach Inkblot Test. This is a device favoured by psychiatrists who ask their patients to talk about the shapes. Psychologists on the other hand are not impressed but, despite this, we think the program is of interest. Perhaps our correspondent has programmed Dragon to interpret patients' comments.

```

1 REM IMPLOT, R.J.GENTLE,GOODMANN
20 PROCS=1:SCREEN=1:PCOLS
30 DIM B(50)
40 H=(PROCS+20)/100
45 C=COLS/250:W=200:H
50 PAINT(250,0)
60 GETTIME:TM=TIME/250:FLG
70 PCOLS=PROCS+20
80 FOR X=1 TO 2
90 S=ABS(COS(A+RAND(32)))
100 PUT(A,S)+A+500+4118:OR
110 NEXT A
120 SOUND 100+5*ABS(W)+S*ABS(C)
130 GOTO 60

```

Mr T. Iwano sends his program JOY-DOODLE which uses the right joystick. On firing the button a line is drawn from the previous point to the current point. Pressing "C" re-runs the program clearing the screen. Other possibilities will suggest themselves to interested readers - using the other joystick for further information such as a centre for a PAINT command. Alternatively lines, circles and boxes could be drawn by using other joystick moves.

```

1 REM JOE DOOBLE.T.BAAR PROSTON
20 PROGRAM INCREMENT.FOLDS
30 PSET(10,6,1)
40 A = JOYSTICK(0) - JOYSTICK
50 X = FOLD(4*KEY - FOLD)*.5
60 PSET(X,1)
70 P = P+(X<0)
80 IF INKEY="C" THEN GOTO
90 IF P = 255 OR P = 254 THEN GOTO PRESET(10,6,1)
100 LINE(10,6),PSET
110 GOTO 30

```

Mrs Pam O'Arcy is a keen QUEST player but has not managed to storm Morlock's castle yet. To continue the same adventure at a future time she offers the following procedure to dump variable values to tape:-

Lead Guest and topic in the following boxes:

[illegible]

Mrs D'Arcy assures us that it works! We added one screen comment and although we have not given it a full test we think *Quest* players will find it very useful.

DRAW A DRAGON LOGO COMPETITION

The editors were delighted with the response to the first competition, with entries from boys and girls both in the U.K. and abroad. After considerable deliberation, Graham Wademan's entry was chosen as the winner of this competition. His logo was excellent and the whole program was professionally packaged. (See for yourself by tuning in the station below.)

All the logos had their own personalities. There were fat, thin, friendly and fiery dragons! One or two entries for the competition did not draw a dragon logo at all and therefore had to be excluded. Nevertheless we appreciate your programs and we print below one such entry that is skillfully constructed and represents a dragon flying! Thank you Bobby Patel for this program.



```

10  PLOT=PAGE001:SCALE=0.0
20  DRAW"BM40.0 0.0 BM + 10.0 0.0"
30  CIRCLE BM,0.0,0.0 PAINT BM,0.0,0.0
40  DRAW"PDY11 0.0 BM110.0 0.0 LINE120.0 0.0 LINE130.0
    LINE140.0 0.0 BM + 10.0 0.0 LINE150.0 0.0
    LINE160.0 0.0 BM + 10.0 0.0 LINE170.0 0.0
    LINE180.0 0.0 BM180.0 0.0 LINE190.0 0.0"
50  PAINT100.0,0.0 PAINT120.0,0.0 PAINT140.0,0.0
    PAINT160.0,0.0
60  DRAW"BM20.0 1.0 LINE130.0 0.0 BM + 3.0 0.0 BM + 5.0
    0.0 BM10.0 0.0"
70  PAINT12.0,0.0,0.0 PAINT10.0,0.0,0.0
80  DRAW"BM - 20.0 0.0 LINE120.0 0.0 BM - 4.0 0.0 BM
    - 5.0 0.0 LINE130.0 0.0 BM - 4.0 0.0"
90  PAINT110.0,0.0,0.0 PAINT110.0,0.0,0.0
100 DRAW"BM0.0 0.0 LINE120.0 0.0 BM - 1.0 0.0 C1
    0.0 0.0 LINE130.0 0.0" PAINT10.0,0.0,0.0
110 DRAW"BM40.0 0.0 C1 C1 BM + 0.0 0.0 LINE140.0 0.0 BM +
    10.0 0.0 LINE150.0 0.0 BM10.0 0.0 BM + 10.0
    LINE160.0 0.0 BM10.0 0.0 BM + 10.0
    LINE170.0 0.0 BM170.0 0.0 BM + 10.0
    LINE180.0 0.0 BM180.0 0.0 BM + 10.0"
120 DRAW"PAINT10.0,0.0,0.0 LINE120.0 0.0 BM + 0.0
    0.0 LINE130.0 0.0 BM + 1.0 0.0"
130 DRAW"BM + 0.0 0.0 LINE120.0 0.0"
140 DRAW"BM + 0.0 0.0 C1 LINE130.0 0.0"
150 0.0 0.0 0.0

```

```
10 CLS:CLRENM
20 A$="" : SP1=STRING$(32)
30 FORN=1 TO 4 : FORL=1 TO 100:READR
40 A$=A$+CHR$(R) : NEXT L
50 A$=A$+SP1:NEXT N
60 FORN=1 TO 4 : B$=B$+STRING$(40)
  +STRING$(32,32):NEXT N : B$=B$+STRING$(40)
```

```

70 FORM = 1270000STEP1
80 PRINT@X,A1 FOR J = 1 TO 6 NEXT PRINT@X,B1
90 NEXT
100 END
110 DATA 142,143,128,129,129
120 DATA 142,143,128,141,143
130 DATA 132,143,128,129,143
140 DATA 129,138,128,129,143

```

SOLUTION TO DRAGON PUZZLE 2

The numerical solutions to the clues gave the appropriate line numbers for the program statements to play the tune "Oh when the saints go marching in". The solutions were in order 1014, 20, 2402, 13, 1001, 1018, 1006, 18.



APPENDIX 1. SOFTWARE CATEGORIES, COMMENTS

Four ants start from the four corners of the **PMODE4** screen and travel in such a way that each ant always travels towards the nearest ant in the clockwise direction. All movement is at the same uniform speed. Write a program to demonstrate the nature of the paths taken by the ants.

The competition is open to all ages and the best solutions in each age group will receive the choice of free Dragon software. Send your entries to the editorial address on a cassette together with your name and address and age (if under 16) not later than September 10th.

DRAGON the teacher



Educational software is now the 'in' thing with the boom in home computers. Commercial educational software is usually sophisticated and consequently time-consuming to write. Nevertheless small programs designed to do a particular task can be fun to write with the advantage that they may be tailor made to your own specific needs.

Take your daughter or son at secondary school who has a language vocabulary to learn each week. The program following is simple and to the point, allowing the user to input a vocabulary in two languages and then answer randomly chosen questions.

```
1 REM LANGUAGE TESTER A.M.SYRIS
2 INPUT "HOW MANY WORDS?" N: DIM A$(N)
3 INPUT "FIRST LANGUAGE": B$(1): INPUT "SECOND LANGUAGE": B$(2)
4 CLS: FOR I = 1 TO N: FOR J = 1 TO 3: PRINT "ENTER WORD":
  L: IN "B$(1)INPUT A$(I): NEXT J
5 I = RND(1): RND(1): IF J = 2 THEN I = 1 ELSE I = 2
6 CLS: PRINT "WHAT IS THE "B$(I):" WORD FOR "A$(I)
7 INPUT A$(1): IF A$(1) = A$(I) THEN PRINT
  "WELL DONE" GOSUB B$(1): GOTO 6 ELSE PRINT
  "NO---TRY AGAIN" GOSUB B$(2): GOTO 6
8 FOR D = 1 TO 40: NEXT: RETURN
```

Or consider building up a vocabulary of English words and their opposites. This can be done with DATA statements so that information can be recorded on tape and extended as and when required.

To have this facility, the program is constructed using a succession of X's at the end of the DATA statements. This serves not only to provide a stop to the READING of the data, but also to leave space on the tape recording for subsequent recordings of an extended version.

```
1 REM OPPOSITES A.M.SYRIS
2 C = 1: DIM A$(20)
3 FOR I = 1 TO 3: READ A$(I): IF LEFT$(A$(I), 1) = "X"
  THEN 3 ELSE NEXT I: C = C + 1: GOTO 3
4 I = RND(1): J = RND(1): IF I = 1 THEN I = 1 ELSE I = 1
5 IF J = 2 THEN K = 1 ELSE K = 2
6 CLS: PRINT "WHAT IS THE OPPOSITE OF "A$(I)
```

```
8 INPUT A$(1): IF A$(1) = A$(I) THEN PRINT "WELL
  DONE" GOSUB B$(1): GOTO 8 ELSE PRINT "TRY
  AGAIN" GOSUB B$(2): GOTO 8
9 FOR D = 1 TO 40: NEXT: RETURN
10 DATA ASLEEP,AWAKE,ADD,SUBTRACT,
  UPSET,FALL,SLEEP,DRINK,FALL,RISE,LARGE,SMALL,
  FAST,SLOW,UGLY,BEAUTIFUL,NEAR,FAR,HIGH,
  LOW,DULL,SENSIBLE,LIGHT,DARK,XXXXXXX
```

These two programs are useful but rather plain. They also suffer (as far as young children are concerned) in demanding a typed response. The last program overcomes this problem by pretending a numbered list. With the addition of movement and sound it also becomes more interesting to the user. Try it and see if you can correctly identify the second member of each pair. (Apologies to Dragon owners in Huddersfield for the repetition!)

```
1 REM PAIRS A.M.SYRIS
2 DIM A$(14), B$(14): FOR I = 1 TO 14: A$(I) = I: NEXT
3 FOR I = 1 TO 14: STEP 1: C = RND(1): A$(C)
  READ A$(I), B$(I), A$(C) = A$(I): B$(C) = I: NEXT I
4 FOR I = 1 TO 14: PRINT @$(I): B$(A$(I)) + " AND " + "NEXT I
5 GOSUB B$(I) FOR I = 1 TO 14
6 PRINT @$(I): B$(I): INPUT IF A$(I) < 1:
  THEN SOUND 1: GOSUB B$(1): GOTO 6
7 RM = 1: GOSUB B$(1): GOTO 7 NEXT I
8 PLAY "A440C" STOP
9 FOR J = 1 TO 14: IF L = 1 THEN NEXT J ELSE PRINT @$(J):
  B$(A$(J)): NEXT J
10 RETURN
11 PLAY "T8040C3180F" GLA: G = 1: FOR K = 1 TO 14: PRINT @$(K):
  B$(A$(K)): B$(K) + STR$(RND(1) * 100) + "NEXT K
12 IF K = 1 THEN ST = 1 ELSE ST = 1
13 FOR K = 1 TO 14: STEP ST: PRINT @$(K): B$(A$(K)): FOR L = 1
  TO 5: NEXT L: PRINT @$(K): B$(A$(K)): ST = RND(1) * 100:
  NEXT K: PRINT @$(1): B$(A$(1)): FOR M = 1 TO 1:
  PRINT @$(M): B$(A$(M)):
  NEXT M: RETURN
14 DATA BOOTS,SHOES,SOAP,WAIVER,KNIFE,FORK,
  NEEDLE,THREAD,BISCUITS,TEA,BACON,EGG,FISH,
  CHIPS,LEAD,SEA,CLOUD,SAUSAGE,HARD,FAST,
  CUP,SAUKE,BLACK,WHITE,LITTLE,LARGE,
  PEK,POKE,KING,QUEEN,SALT,PEPPER
```

More new titles ...

Watch out for the following new titles in the official Dragon software list. They will be appearing in your shops soon.

Viking
Monsters and Magic
Words, Words, Words
Lost Castle

Blackbeard
Nerfke Force
Adventure Trilogy
Beyond the Colossal Moon

Fork
Bridge
Moon Hooper
Jumpjet

Laser Rover Patrol
Cosmos Clones
El Sandie
Star Fighter
Super Dragon Writer 11