insulated from the top surface as it is at earth potential anyway. Be careful to get the pot orientation right, the middle leg of the pot goes to the pad with two holes in it, the board is designed to take two sorts of pots, hence the extra mounting holes. If building the *FM7* components C13, C14 and C15, R9, R10, L2 and X1 are not fitted. Before switching on check for solder splashes and dry joints etc. A small modern iron must be used and the component legs cut off close to the PCB. The 1n capacitors supplied are little red ones with a black dot on them. The 100n are either blue or red in a shiny plastic case. The positive end of D1 and D2 is indicated by a stripe or band towards one end.

Installation

The *FM42* should be connected to a suitable point in the receiver, preferably before the main selectivity filter, although this may be difficult if it is a mixer stage where a high level of local oscillator is present which may overload the *FM42* mixer. It may be necessary to provide an LC tuned circuit on the IF frequency in use to reject the oscillator. In other receivers using the *FM7* module, the 455KHz signal should be extracted somewhere in the IF again preferably before the main filter. As this point will vary for each individual receiver no specific technical advice can be given, although if a circuit diagram and stamped addressed envelope are sent to Timestep, then the company will advise.

For the *FRG7* receiver it is possible to completely integrate the detector using these instructions. Uncase the *FRG7* by removing the nine Philips screws and the small black feet. Put the receiver upside down with the controls to the front. Locate the rear wafer of S3 and the mode switch, which is furthest from the front panel. Find the inner conductor of the blue screened cable which is connected to two tags at the bottom of the switch nearest the PCB. Remove this wire and clean both switch contacts. Replace the blue wire on the tag furthest away from the PCB that it was originally connected to. The now spare tag next to the nut on the switch should be connected via a length of wire to pin 3 of the *FM7* module.

Turn the receiver the right way up with the front panel facing you and locate TP405 which is on the PCB immediately below the loudspeaker and near the front right hand edge. Remove the board fixing screw close to it and put a solder tag on this screw and replace it in the PCB. Connect the inner of a length of coax to TP405 and its screen to the fitted solder tag. This coax goes to pins 5 and 6 of the *FM7*, pin 5 of course being the inner of the coax. On the same PCB locate TP408 which is the power supply pin and is on the back edge of the board about half an inch in and fairly close to T401. Connect this pin via a length of wire to pin 8 of the *FM7* module. These simple steps complete the fitting installation.

If a mute inhibit function is required, and it is suggested that this is fitted, then locate the light switch on the *FRG7* and the three spare contacts on one side of it. Connect two wires, one to the middle contact and the other to the contact nearest the PCB and take these to pins 2 and 7 of the *FM7* module. When the light switch is switched off the mute will be disabled although the light switch will still perform as normal. The FM mode is selected by turning the mode

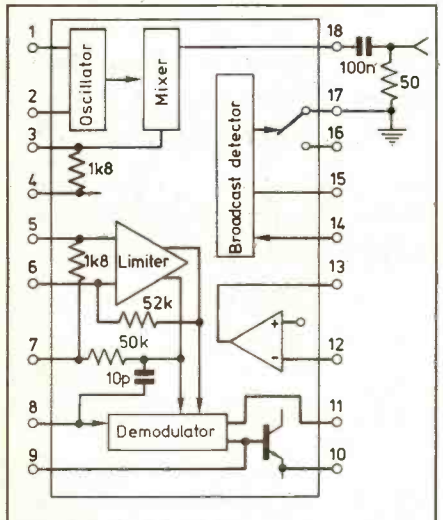
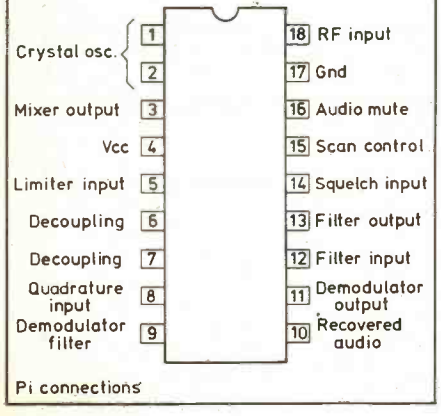


FIG. 1. Functional block diagram



IC1 pin connections.

Table 1 Components List

Resistors	
R1	100k
R2	10k
R3,8	68k
R4	22k
R5,13,15	1k
R6	270k
R7	120k
R9	FM42
R10	FM42
R11	470k
R12	47/50k pot
R14	100R
R16	47k
R17	220R
Capacitors	
C1	150p
C2,12,18	2μ
C3,4,6,7,10,11,17	100n
C5	22p
C8,9,16,19,20,21	1n
C13	FM42
C14	FM42
C15	FM42
Semiconductors	
Q1	BF199
IC1	ULN3859 (MC3359)
D1	1N4148
D2	not fitted
D3	7V5 Zener
Miscellaneous	
F1	CFU455
X1	FM42
L2	FM42
PCB	Timestep
SK1	10 way PCB plug
SL1	10 way shell
SP1	10 off pins
HR	9 off hollow rivets
L1	YHCS11100

Table 2 Connection Data

PIN 1	AFC output
2	Ground
3	Audio output
4	Ground
5	RF input
6	Ground
7	Mute defeat
8	+VE input 9-17 volts DC
9	Scan output
10	7.5 Volt output

Note: For maximum sensitivity on FM7 connect pins 1&2 together on the IC. (not needed on FRG7).