REMOTE CONTROL OF FIREMEN'S CALL-BELLS AND SIREN
Systems A, B, B(Modified) and C
Control via P.O. Private Circuits

1. General. This Instruction gives general information on Systems A, B, B(Modified) and C for the remote control of firemen's call-bells and siren via P.O. private circuits. For new work, Systems B, B(Modified) and C will be superseded by System K (see B 3050) when existing stocks of control-units are exhausted.

2. A general description of remote control of firemen's call-out systems is given in B 3015. The firemen's call-bell system should continue to be provided in accordance with B 1001, B 1010 and B 3001. The terms used in this Instruction are in accordance with B 0003.

SYSTEM A

3. Facilities. This system provides for the remote operation, up to a radial distance of one mile, of the renter's siren via a P.O. private circuit. No answer-back signal is provided because the siren can be heard at the call-out point when the radial distance between the call-out and ring-out points does not exceed one mile.

4. Field of Use. System A should be used for the remote control of a renter's siren for firemen's call-out via a P.O. private circuit if the radial distance between the call-out and ring-out points does not exceed one mile.

5. Mains Supplies. A 50 c/s. A.C. mains supply of 200/250V. or 100/110V. is necessary at the call-out and ring-out points.

6. Details of Apparatus.

(a) Call-out point apparatus. The apparatus required at the call-out point is shown on Dgm. FA 207 Fig. 1. The main item is the "Frequency-changer No. 5" which produces the 100 c/s. signalling current for the remote control via the P.O. private circuit. Its wiring is shown on Dgm. SA 5011.

(b) Ring-out point apparatus. The apparatus at the ring-out point is shown on Dgm. FA 207, Fig. 3. The main item is the "Relay-switch No. 201A/1" or "No. 101A/2". The electrical characteristics of these relay-switches are shown on Dgm. SA 9067.

7. Operating Procedure. If it is necessary for engineering officers to make a test call-out from the call-out point for maintenance purposes, the prior authority and co-operation of the renter should be obtained to ensure that the firemen do not respond to the call-out. When this precaution had been taken, the control switch at the call-out point should be operated. This switch extends the 100 c/s. signalling current from the frequency-changer to line, operating the tuned 100 c/s. relay-switch at the ring-out point. This relay-switch completes the circuit for the renter's siren contactor, and the siren at the ring-out point will sound while the control switch at the call-out point is operated. No answer-back signal is given, but the siren can be heard at the call-out point.

SYSTEM B

8. Facilities. System B provides the following facilities:-

(a) The operation of a system of firemen's call-bells and siren from a remote point via a P.O. private circuit of up to one mile radial distance.

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(b) Control of the call-bells and siren, once they have been set in operation, by a synchronous motor which cannot be stopped from the call-out point.

(c) Intermittent ringing of the call-bells (three seconds ON and two seconds OFF) for a period of approximately on minute.

(d) The sounding of a continuous note by the siren for a period of approximately one minute.

(e) Running-call facility by means of a "Press-button G" provided outside the ring-out point station.

No answer-back signal is provided because the siren can be heard at the call-out point if the radial distance between the call-out point and ring-out point does not exceed one mile.

9. Field of Use. System B is in use for the remote control of firemen's call-bells and siren via P.O. private circuits for radial distances not exceeding one mile.

10. Mains Supplies. A 50 c/s. A.C. mains supply of 200/250V. or 100/110V. is necessary at the call-out and ring-out points (also at remote-siren point if existing).

11. Details of Apparatus.

(a) Call-out point apparatus. The apparatus required at the call-out point is shown on Dgm. FA 208, Fig. 1. The main item is the "Frequency-changer No. 5" which produces the 100 c/s. signalling current for the remote control via the P.O. private circuit. Its wiring is shown on Dgm. SA 5011.

(b) Ring-out point apparatus (siren local). The apparatus required at the ring-out point is shown on Dgm. FA 209, Fig. 3. The main items are "Control-unit FA 223" and "Relay-switch No. 201A/1" or "No. 101A/2". The wiring of the control-units is shown on Dgm. FA 223, and the electrical characteristics of the relay-switches are shown on Dgm. SA 9067.

(c) Ring-out point apparatus (siren remote). The apparatus required at the ring-out point is shown on Dgm. FA 209, Fig. 3. The main items are "Control-unit FA 223", "Relay-switch No. 201A/1" or "No. 101A/2" and "Frequency-changer No.5". The wiring of the control-unit is shown on Dgm. FA 223, the wiring of the frequency-changer is shown on Dgm. SA 5011, and the electrical characteristics of the relay-switches are shown on Dgm. SA 9067.

(d) Remote-siren point. The apparatus required at the remote-siren point is as shown on Dgm. FA 209, Fig. 5. The main item is the "Relay-switch No. 201A/1" or "No. 101A/2".

(e) Running-call facility. If this facility is requested by the renter, a "Press-button G" should be fitted in a "Box, Fire Alarm, No. 7". This complete unit is normally located outside the ring-out point in a position accessible to the public.

12. Operating Procedure. If it is necessary for an engineering officer to make a test call-out from the ring-out point for maintenance purposes, the prior authority and co-operation of the renter should be obtained to ensure that the firemen do not respond to the call-out. Having taken this precaution, the following operating procedure should be adopted:-

(a) Operate the control switch at the call-out point, to extend the 100 c/s. signalling current from the frequency-changer to line, operating the tuned 100 c/s. relay-switch at the ring-out point. This relay-switch completes the circuit for the motor-unit of the "Control-unit FA 223". The motor-unit runs for approximately one minute under the control of one of its spring-sets, controls the ringing of the call-bells, and operates the relay-switch which completes the circuit for the renter's siren contactor.

(b) When the siren is heard at the call-out point, the control switch at this point must be released; the siren will sound for approximately one minute. When the siren ceases to sound, the system has restored to its normal condition.

SYSTEM B(MODIFIED)

13. Facilities. System B(Modified) provides the following facilities:-

(a) The operation of a system of firemen's call-bells and siren from a remote point via a P.O. private circuit.

(b) A continuous answer-back signal from the ring-out point to the call-out point, operating the indicator at the latter while the siren relay is operated.

(c) Automatic control of the call-bells and siren, once they have been set in operation, under the control of a synchronous motor which cannot be stopped from the call-out point.

(d) Intermittent ringing of the call-bells (three seconds ON, two seconds OFF) for a period of approximately one minute.

(e) The sounding of a continuous note by the siren for a period of approximately one minute.

(f) An additional remote control circuit for the siren if the siren is remote from the ring-out point.

(g) Running-call facility by means of a "Press-button G" provided outside the ring-out point.

(h) Bothway speech via the private circuit between the call-out point and ring-out point, using generator signalling.

14. Field of Use. System B(Modified) is in use for the remote control of firemen's call-bells and siren via P.O. private circuits if the radial distance between the call-out and ring-out points exceeds one mile. This system was introduced at a period when it was difficult to obtain control-units for System C.

15. Mains Supplies. A 50 c/s. A.C. mains supply of 200/250V. or 100/110V. is necessary at the call-out point and ring-out point (also at remote-siren point if existing).

16. Details of Apparatus.

(a) Call-out point apparatus if only one ring-out point is controlled. The apparatus required at the call-out point is shown on Dgm. FA(L) 233. The main item is the "Frequency-changer No. 4", which produces the 100 c/s. signalling current for the remote control via the P.O. private circuit. Its wiring is shown on Dgm. SA 5010. To provide the facilities additional to those of System B, the auxiliary apparatus shown on Dgm. FA(L) 233, Fig. 3, is necessary.

(b) Call-out point apparatus if two or more ring-out points are controlled. The apparatus required at the call-out point is shown in Dgm. FA(L) 234. The main item is the "Frequency-changer No. 4". Its wiring is shown on Dgm. SA 5010. To provide the facilities additional to those of System B, the auxiliary apparatus shown on Dgm. FA(L) 234, Fig. 3, is necessary.

(c) Ring-out point apparatus. The apparatus required at the ring-out point is shown on Dgm. FA(L) 235. The main items are the "Control-unit FA 223" and "Relay-switch No. 201A/1" or "No. 101A/2". The wiring of the "Control-unit FA 223" is shown on Dgm. FA 223. If the siren is remote from the ring-out point a "Frequency-changer No. 5", as shown on Dgm. FA(L) 235, Fig. 3, is required in addition.

(d) Remote-siren point. The apparatus required at the remote-siren point is shown on Dgm. FA(L) 235, Fig. 4. The main item is the "Relay-switch No. 201A/1" or "No. 101A/2". The electrical characteristics of these relay-switches are shown on Dgm. SA 9067.

17. Operating Procedure. If it is necessary for engineering officers to make a test call-out from the call-out point for maintenance purposes, the prior authority and co-operation of the renter should be obtained to ensure that the firemen do not respond to the call-out. Having taken this precaution, the following operating procedure should be adopted:-

(a) Operate the control switch at the call-out point. This switch connects the mains supply to the frequency-changer, and the 100 c/s. signalling current is extended to line, operating the tuned 100 c/s. relay-switch at the ring-out point. This relay-switch completes the circuit for the motor-unit of the "Control-unit FA 223". This motor-unit runs for approximately one minute under the control of one of its

spring-sets, controls the ringing of the call-bells, and operates the relay-switch which completes the circuit for the renter's siren contactor. The operation of the control-unit returns an answer-back signal to the call-out point, operating the associated indicator, Dgm. FA(L) 233, Fig. 3 or FA(L) 234, Fig. 3 at the call-out point.

(b) When the indicator operates, the control key at the call-out point should be restored. The indicator remains operated for approximately one minute after which it releases. When the indicator releases, the system has restored to its normal condition.

SYSTEM C

18. Facilities. System C provides the following facilities:-

(a) The operation of a system of firemen's call-bells and siren from a remote point via a P.O. private circuit.

(b) An answer-back signal from the ring-out point to the call-out point, operating a supervisory lamp at the latter while the siren relay is operated and the control switch is operated.

(c) The automatic control of the call-bells and siren, once they have been set in operation, under the control of a synchronous motor which cannot be stopped from the call-out point.

(d) The intermittent ringing of the call-bells (three seconds ON and two seconds OFF) for approximately one minute.

(e) The sounding of a continuous note by the siren for approximately one minute.

(f) An additional remote control circuit to the siren if the siren is remote from the ring-out point.

(g) Bothway speech via the private circuit between the call-out point and ring-out point, using generator signalling.

(h) Continuous line testing of the private circuit between the call-out and ring-out points.

19. Field of Use. System C is in use for the remote control of a siren via P.O. private circuit if the radial distance between the call-out and ring-out points exceeds one mile. This system is also in use for the remote control of a system of firemen's call-bells and siren via a P.O. private circuit if the radial distance between the call-out and ring-out points exceeds one mile.

20. Mains Supplies. A 50 c/s. A.C. mains supply of 200/250V. or 100/110V. is necessary at the call-out point and ring-out point (also at remote siren point if existing).

21. Details of Apparatus.

(a) Call-out point apparatus. The apparatus required at the call-out point is shown on Dgm. FA 212, Fig. 1. The main item is a "Control-unit FA 221"; its wiring is shown on Dgm. FA 221. This unit supplies the line test current and, in addition, when a call-out signal is sent from the call-out point, it removes the line test current and applies 50 c/s. A.C. to operate a 50 c/s. tuned relay at the ring-out point.

(b) Ring-out point apparatus if a siren only is provided. The apparatus required at the ring-out point is shown on Dgm. FA 212, Fig. 2. The main items are "Control-unit FA 222" and the "Relay-switch No. 3106 NL $\frac{1-15}{Aw}$". The wiring of the "Control-unit FA 222" is shown on Dgm. FA 222. The control-unit is provided for the following reasons:-

(i) To receive the 50 c/s. call-out signal extended from the call-out point.

(ii) To operate the relay-switch which connects the mains supply to the renter's siren contactor.

(iii) To provide the answer-back current applied to the private circuit when the siren relay-switch operates, to indicate the receipt of the call-out signal at the ring-out point.

(iv) To relay failure of the mains supply at the ring-out point to the call-out point.

(c) Ring-out point apparatus if call-bells and local siren are provided. The apparatus required at the ring-out point is shown on Dgm. FA 212, Fig. 3. The main items are "Control-unit FA 222" and "Control-unit FA 223"; the wiring of these units is shown on Diagrams FA 222 and FA 223 respectively. The "Control-unit FA 222" is provided for the following reasons:-

(i) To receive the 50 c/s. call-out signal extended from the call-out point.

(ii) To operate the start relay of the "Control-unit FA 223" for the motor-unit.

(iii) To relay failure of the mains supply at the ring-out point to the call-out point.

The Control-Unit FA 223 is provided for the following reasons:-

(i) To ring the call-bells intermittently (three seconds ON, two seconds OFF) for a period of approximately one minute.

(ii) To sound the siren continuously for a period of approximately one minute when required.

(iii) To provide the answer-back signal current to the line when the siren relay operates, to indicate the receipt of the call-out signal at the ring-out point.

(d) Ring-out point apparatus if call-bells and remote siren are provided. The apparatus required at the ring-out point is shown on Dgm. FA 212, Fig. 4. The items required are those described in par. 21*(c)*, with the addition of a "Frequency-changer No. 5", which produces the 100 c/s. signalling current for the remote control via the P.O. private circuit to the remote-siren point. Its wiring is shown in Dgm. SA 5011.

(e) Remote-siren point apparatus. The apparatus required at the remote-siren point is a "Relay-switch No. 201A/1" or "No. 101A/2". The electrical characteristics of these relay-switches are shown on Dgm. SA 9067.

22. Control-unit Mark Numbers. Table 1 shows the various mark numbers of the control-units for System C.

TABLE 1

Diagram	Control-units		
	FA 221	FA 222	FA 223
FA 212/0	MK2	MK2	MK1
FA 212/1	MK3	MK3	MK2
FA 212/2	MK4	MK4	MK2

The main differences between the various mark numbers of the control-units are shown in Table 2.

TABLE 2

Mark Numbers	Control-units		
	FA 221	FA 222	FA 223
1	–	–	Dgm. FA 223/0
2	Dgm. FA 221/0	Dgm. FA 222/0	Dgm. FA 223/1 Single-pole fusing for the mains supply. Mains supply block terminal changed to a "Block, Terminal, No. 21/6" and mains supply wiring of unit changed

TABLE 2 *(Contd.)*

Mark Numbers	Control-units		
	FA 221	FA 222	FA 223
3	Dgm. FA 221/1 Single-pole fusing for mains supply. "Connector-socket, Mains, No. 5" fitted instead of "Block, Terminal, No. 21/6" for connexion of mains supply leads to the unit	Dgm. FA 222/1 Single-pole fusing for mains supply and "Connector-socket, Mains, No. 4" added for connexion of mains supply to unit. Standard Rate Book type of electrolytic capacitor fitted instead of non-standard item	-
4	Dgm. FA 221/2 The 50 M.F. electrolytic capacitor (QB) added, to reduce ripple extended to line	Dgm. FA 222/2 "Relay-switch No. 2014/2" recovered and circuit modified to use 3000-type relay with Rate Book type rectifier element. Relay MF added, and Relay LF changed	-

If a Mark 4 "Control-unit FA 222" is used at the ring-out point, a Mark 4 "Control-unit FA 221" should be used at the call-out point; with this exception, control units having different mark numbers are interchangeable.

23. Operating Procedure. If it is necessary for engineering officers to make a test call-out from the call-out point for maintenance purposes, the prior authority and co-operation of the renter should be obtained to ensure that the firemen do not respond to the call-out. Having taken this precaution, the following operating procedure should be adopted:-

(a) If the siren only is remotely controlled:-

(i) Operate the control switch at the call-out point. This switch extends the 50 c/s. signalling current to line, operating the signal receive relay of the "Control-unit FA 222" at the call-out point. The circuit for the renter's contactor is completed, and the siren sounds. When the siren relay-switch operates, an answer-back signal is extended from the ring-out point to the call-out point, and the supervisory lamp at the latter glows.

(ii) Observe that the supervisory lamp at the call-out point glows; this occurs after the siren relay-switch has operated, and the lamp will continue to glow while the control switch is operated.

(iii) Restore the control switch to normal. The remote control system then restores to its normal condition.

(b) If call-bells and siren are remotely controlled:-

(i) Operate the control switch at the call-out point. This switch extends the 50 c/s. signalling current to line, operating the signal receive relay of the "Control-unit FA 222" at the ring-out point. This unit completes the circuit for the "Control-unit FA 223" which controls the ringing of the call-bells, the sounding of the siren, and the answer-back current from the ring-out point to the call-out point.

(ii) Observe that the supervisory lamp at the call-out point glows.

(iii) Restore the control switch. The supervisory lamp will darken, but the call-bells will ring and the siren will sound for a period of approximately one minute from the time that the supervisory lamp commences to glow. After the period of approximately one minute the control system restores to its normal condition.

24. Operation and Line Fault Indications. The Diagram Notes relating to Dgm. FA 212 describe the operation of the remote control system and list the various line fault indications. These diagram notes should be requisitioned in the normal way.

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25. Mounting of Tuned Relay-switches. The "Relay-switches No. 101A/1 or "No. 101A/2" and "Control-units FA 222" should be mounted as rigidly as possible to obviate false operation due to mechanical shock.

26. Maintenance Testing of the Private Circuit. Before any test is made of the private circuits for the Systems A, B, B(Modified) and C, the engineering officer must first advise the renter so that the siren and call-bells may be made inoperative during the period of the test.

27. Renter's Responsibilities. In addition to providing suitable accommodation for the P.O. equipment at the call-out point, ring-out point (and remote-siren point if existing) the renter will be responsible for providing the following:-

(a) All necessary 5-amp. 3-pin switch-sockets to B.S. 546 (equivalent to "Socket-outlets No. 8") on which should be terminated 50 c/s. A.C. mains supplies of 200/250V. or 100/110V. and effective earth connexions.

(b) The siren, contactor and the associated wiring and power supply for the operation of the siren.

(c) The wiring between the control-units, or P.O. relay-switch, and the renter's apparatus.

(The actual connexion of this wiring to the P.O. apparatus should be made by P.O. staff. All renter's wiring must be kept well clear of P.O. wiring).

(d) A suitable isolating switch, or fuses, which will enable the operation of the contactor to be checked during routine testing without operating the siren.

(e) Siren cut-off switch if the siren is local.

(f) Emergency switch if the siren is local or remote. If the siren is remote, the switch should be at the siren point.

(g) A time switch to disconnect the siren contactor and so prevent operation of the siren during the night.

28. Functional Tests of Systems. The renter will be responsible for the frequency and nature of the functional routine testing and will arrange for the tests to be made. It is expected that there will normally be daily tests of the call-bell system and a weekly test of the siren. A key is provided for disconnecting the call-bells as necessary during testing. If this key is operated, only the station call-bell will ring when a test call-out signal is sent from the call-out point. A switch for disconnecting the siren circuit is also provided, either by the renter or by the P.O., according to whether the siren is local or remote.

29. Operating Procedure. Detailed instructions on the operation of the remote control equipments will be issued by the Fire Service authorities to their personnel.

References:- B 0003, B 1001, B 1010, B 3001, B 3015, B 3050
(S1)

Instruction cancelled:- A 3101

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